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FORM PTO-1390 (REV. 5-93)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	
<b>TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371</b>		ATTORNEY'S DOCKET NUMBER <b>11150/45</b>	
		U.S. APPLICATION NO. (If known, see 37 CFR 1.5) <b>10/070074</b>	
INTERNATIONAL APPLICATION NO. <b>PCT/EP00/08250</b>	INTERNATIONAL FILING DATE <b>24 August 2000 (24.08.00)</b>	PRIORITY DATE CLAIMED <b>3 September 1999 (03.09.99)</b>	
TITLE OF INVENTION <b>METHOD AND DEVICE FOR ACTIVELY ASSISTING A MOTOR VEHICLE DRIVER IN A MOTOR VEHICLE</b>			
APPLICANT(S) FOR DO/EO/US <b>HEISE, Gilbert; DIRKSEN, Susanne; BUSSE, Gerald and LILIENTHAL, Joerg</b>			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information			
<ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) immediately rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</li> <li>4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</li> <li>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))           <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</li> <li>b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau.</li> <li>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US)</li> </ol> </li> <li>6. <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</li> <li>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))           <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</li> <li>b. <input type="checkbox"/> have been transmitted by the International Bureau.</li> <li>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li>d. <input checked="" type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</li> <li>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (Unsigned).</li> <li>10. <input checked="" type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</li> </ol>			
<b>Items 11. to 16. below concern other document(s) or information included:</b>			
<ol style="list-style-type: none"> <li>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li>13. <input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment.  <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> <li>14. <input checked="" type="checkbox"/> A substitute specification and marked-up version thereof..</li> <li>15. <input type="checkbox"/> A change of power of attorney and/or address letter.</li> <li>16. <input checked="" type="checkbox"/> Other items or information: Search Report, IPER, PCT/RO/101</li> </ol>			

451255

[11150/45]

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Inventor(s) : Gilbert HEISE et al.  
Serial No. : To Be Assigned  
Filed : Herewith  
For : METHOD AND DEVICE FOR ACTIVELY ASSISTING A  
MOTOR VEHICLE DRIVER IN A MOTOR VEHICLE  
Examiner : To Be Assigned  
Art Unit : To Be Assigned

Assistant Commissioner for Patents  
Washington, D.C. 20231

**PRELIMINARY AMENDMENT AND  
37 C.F.R. § 1.125 SUBSTITUTE SPECIFICATION STATEMENT**

S I R:

Kindly amend the above-captioned application before examination, as  
set forth below.

**IN THE SPECIFICATION AND ABSTRACT:**

In accordance with 37 C.F.R. § 1.121(b)(3), a Substitute Specification  
(including the Abstract, but without claims) accompanies this response. It is  
respectfully requested that the Substitute Specification (including Abstract) be  
entered to replace the Specification of record.

**IN THE FIGURES:**

Please amend Figures 1 to 6 as indicated on the attached red-marked  
sheets.

**IN THE CLAIMS:**

On the first page of the claims, first line, change "What is Claimed is:"  
to --WHAT IS CLAIMED IS:--.

Please cancel, without prejudice, claims 1 to 10 in the underlying PCT application. Please also cancel, without prejudice, claims 1 to 8 in the annex to the International Preliminary Examination Report.

Please add the following new claims:

--9. (New) A method for actively assisting a motor vehicle driver in a motor vehicle using at least one control unit and an input and output unit, the control unit configured to access data of sensors and control units relevant to a condition of the motor vehicle and to transmit control commands to the control units and devices configured for external communication, comprising the steps of:

detecting a critical vehicle condition by the control unit by evaluating the data of the sensors and the control units;

generating a list of possible actions for the motor vehicle driver in response to the critical vehicle condition detected in the detecting step;

displaying the detected critical vehicle condition and the list of possible actions of the motor vehicle driver on a display unit of the input and output unit; and

executing an action selected by the motor vehicle driver using the control unit.

10. (New) A method for actively assisting a motor vehicle driver in a motor vehicle using at least one control unit and an input and output unit, the control unit configured to access data of comfort control units and to transmit control commands to the comfort control units, comprising the steps of:

manually activating the method by the motor vehicle driver;

displaying an input prompt on a display unit of the input and output unit relating to which comfort setting should be changed;

context-sensitive and preference-sensitive compiling of at least one of operational settings and control element relevant to the input prompt on the display unit using the control unit; and

executing input control commands.

11. (New) A method for actively assisting a motor vehicle driver in a motor vehicle using at least one control unit and an input and output unit, the control unit configured to access at least one of an internal database and an external database, comprising the steps of:

manually activating the method by the motor vehicle driver;  
 displaying a list of possible recommendations on a display unit of the input and output unit;  
 executing at least one of a context-sensitive and a preference-sensitive interrogation dialog to ascertain a driver command;  
 displaying possible actions performable in response to the ascertained driver command; and  
 executing an action selected by the motor vehicle driver using the control unit.

12. (New) A device for actively assisting a motor vehicle driver in a motor vehicle, comprising:

at least one control unit configured to evaluate detected conditions critical to the motor vehicle; and

an input and output unit configured to detect and display conditions critical to the motor vehicle using the control unit, to generate and display a list of possible actions of the motor vehicle driver in response to the detected conditions critical to the motor vehicle as an input option with the condition critical to the motor vehicle; wherein the control unit is configured to perform a selected input option.

13. (New) The device according to claim 12, wherein the control unit is connected to at least one other control unit of the motor vehicle by a CAN bus.

14. (New) The device according to claim 12, wherein the display unit includes a touch screen.

15. (New) The device according to claim 12, wherein the input and output unit includes an input device, the input device including at least one of a voice-recognition unit and a bidirectional, rotary pressure transducer.

16. (New) A device for actively assisting a motor vehicle driver in a vehicle, comprising:

at least one control unit configured to acquire data of comfort control units and to control the comfort control units; and

an input and output unit including a display unit configured to display input prompts for selecting a comfort setting using the control unit, the display unit configured to display at least one of operational settings and control elements relative to selected comfort settings in a context-sensitive and preference-sensitive matter;

wherein the control unit is configured to execute input control commands for the at least one of the operational settings and the control elements.

17. (New) The device according to claim 16, wherein the control unit is connected to at least one other control unit of the motor vehicle by a CAN bus.

18. (New) The device according to claim 16, wherein the display unit includes a touch screen.

19. (New) The device according to claim 16, wherein the input and output unit includes an input device, the input device including at least one of a voice-recognition unit and a bidirectional, rotary pressure transducer.--.

### **REMARKS**

This Preliminary Amendment cancels, without prejudice, claims 1 to 10 in the underlying PCT Application No. PCT/EP00/08250. This Preliminary Amendment further cancels, without prejudice, claims 1 to 8 in the annex to the International Preliminary Examination Report and adds new claims 9 to 19. The new claims, inter alia, conform the claims to U.S. Patent and Trademark Office rules and does not add any new matter to the application.

In accordance with 37 C.F.R. § 1.121(b)(3), the Substitute Specification (including the Abstract, but without the claims) contains no new matter. The amendments reflected in the Substitute Specification (including Abstract) are to conform the Specification and Abstract to U.S. Patent and Trademark Office rules or to correct informalities. As required by 37 C.F.R. §§ 1.121(b)(3)(iii) and 1.125(b)(2), a Marked Up Version of the Substitute Specification comparing the Specification of record and the Substitute Specification also accompanies this Preliminary Amendment. Approval and entry of the Substitute Specification (including Abstract) is respectfully requested.

The underlying PCT Application No. PCT/EP00/08250 includes an International Search Report, dated November 2, 2000, a copy of which is included. The Search Report includes a list of documents that were considered by the Examiner in the underlying PCT application.

The underlying PCT Application No. PCT/EP00/08250 also includes an International Preliminary Examination Report, dated December 21, 2001. An English translation of the International Preliminary Examination Report and annex thereto is included herewith.

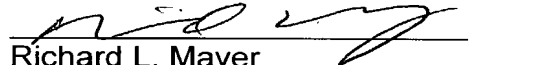
It is respectfully submitted that the subject matter of the present application is new, non-obvious and useful. Prompt consideration and allowance of the application are respectfully requested.

Respectfully submitted,

KENYON & KENYON

Dated: 3/1/02

By:

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METHOD AND DEVICE FOR ACTIVELY ASSISTING A  
MOTOR VEHICLE DRIVER IN A MOTOR VEHICLE

FIELD OF THE INVENTION

The present invention relates to a method and a device for implementing the method of actively assisting a motor vehicle driver in a motor vehicle.

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BACKGROUND INFORMATION

Motor vehicles represent an overall system, which is becoming increasingly complex and, on one hand, offers a motor vehicle driver more and more comfort options and, on the other hand, is provided with an increasing number of safety-related systems. However, these safety-related systems must be monitored with regard to their functionality. In the case of a defect or a condition that is critical for the vehicle, a motor vehicle driver often does not know how he or she should react to such an error message indicated, for example, by a lit-up LED. In addition, it is difficult for most motor vehicle drivers to remember how to correctly operate all of the comfort systems, such as navigation, engine-independent heating systems, air conditioning, seat adjusters, mirror adjusting systems, telephone, audio, etc. This results in a multitude of comfort options, which would otherwise be used, not being used at all. In addition, the existing displays only show the motor vehicle driver the actual states, such as "the tank is empty", "inspection interval elapsed", or "for safety reasons, television only during standstill".

Therefore, it is an object of the present invention to provide a method and a device for actively assisting a motor vehicle driver in a motor vehicle, which prevent the problems described above.

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SUMMARY

To this end, the control unit and an input and display unit automatically assist in the communication between the motor vehicle driver and the vehicle. In order to assist the motor vehicle driver, he or she is offered context- and/or preference-sensitive input options, which are automatically implemented after being selected by the motor vehicle driver.

In an example embodiment of the present invention, a control unit monitors the conditions of the vehicle and displays these on a display unit, together with possible actions. The action selected by the motor vehicle driver is then automatically executed by the device. If the control unit detects, for example, that the engine temperature has exceeded its permissible value, then this is automatically represented on the display unit. In addition, the possible actions such as "shut off engine", "call nearest garage", or "ignore" are represented on the display unit. If the motor vehicle driver selects the action "shut off engine", then the device automatically switches off the engine. If, however, the motor vehicle driver selects the action "call nearest garage", then the device uses the data of a navigation device to search for the next service station, and uses a car-phone system to automatically dial the number of the service station.

Therefore, the method is not only used to display the critical conditions to the motor vehicle driver, but also to display the appropriate countermeasures, which are then actively supported, as well. To this end, the individual countermeasures may be stored in a situation-specific manner in a memory assigned to the control unit. Examples of other critical vehicle conditions include the engine-oil level.

The motor vehicle driver may also be actively assisted in the adjustment of comfort components. For this purpose, the control unit is connected to the corresponding comfort devices. After the motor vehicle driver has manually activated the method, the possible comfort systems are

initially represented on the display unit, from which the motor vehicle driver may then select the desired comfort components. In addition, it should be noted that, in this case, manual activation is to be understood as the opposite of automatic activation and therefore includes activation by voice command, as well. After the motor vehicle driver has selected the desired comfort components, the display unit displays which changes may be made and how they may be performed. In this context, the display occurs in a context-sensitive manner, i.e., only information relevant for the adjustments is displayed.

If the display unit is configured as a touch screen, then the corresponding control elements may be ordered in a context-sensitive manner and displayed on the display unit.

The motor vehicle driver may receive further, active assistance from recommendations such as eating, resting, refueling, parking, or spending the night. To this end, the motor vehicle driver manually activates the method again and selects from a suggestion list the recommendations he would like to receive. Access to the data of a navigation system allows a list of possible suggestions to be compiled, driver preferences possibly being considered. In the individual recommendations, the motor vehicle driver may have details displayed for him and, after selecting a recommendation, he may be navigated to what is recommended or make an order, in which case the number may be automatically dialed.

The individual methods may also be combined, i.e., one may simultaneously intervene in comfort components and vehicle-condition components. If, for example, the motor vehicle driver selects a television mounted in the vehicle, while driving, then the driver is informed, on one hand, that this is not permissible while driving. In addition, the warning is immediately followed by an inquiry as to whether a possibility for parking may be sought after. If the motor vehicle driver

answers this in the affirmative, then the system searches for the next parking possibility with the aid of a navigation system, and navigates the motor vehicle driver to it. Preparatory adjustments, such as the selection of a station, may already be checked and performed parallelly to navigating. If the motor vehicle was navigated to the parking spot, the motor vehicle driver is asked if the engine may be shut off, which may then be automatically executed by the system.

The present invention is explained below in detail, using an example embodiment.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic view of a display on a display unit, after the method has been activated.

Fig. 2 is a schematic view of a display on the display unit, after the driver has input a request for recommendations.

Fig. 3 is a schematic view of a display of a hit list.

Fig. 4 is a schematic view of a detailed display of a hit.

Fig. 5 is a schematic view of a display of the hits on a digital map.

Fig. 6 is a schematic view of a display of an automatically displayed, critical vehicle condition.

#### DETAILED DESCRIPTION

The method for actively assisting a motor vehicle driver in a motor vehicle is assigned an activation field 1, which may be arranged at the same position on display unit 5, which takes the form of a touch screen. If this activation field 1 is activated, then a control unit changes the current display on display unit 5 and generates a first input menu 6 on display unit 5. This input menu 6 includes a marking indicating that

the method is activated, in which the name of the function, for example "BUTLER", is made visible, the upper edge of input menu 6 also being rounded off. Furthermore, input menu 6 includes three input fields 2, on which the selection options are alphanumerically displayed. In this context, the user may select among the input options "recommendations", "help", and "repeat status message", input fields 2 being configured as touch fields. Alternatively, or in addition, the input may be accomplished by voice command and/or using a bidirectional, rotary pressure transducer, which, for example, is described in European Published Patent Application No. 0 366 132. If input option 2a, "recommendations", is selected, the control unit generates a display illustrated in Fig. 2.

In this case, input menu 6 illustrated in Fig. 1 has been moved up on display unit 5. A menu 7 of the areas, for which the method may give the user recommendations, in this case "eating", "resting", "refueling", "parking", and "lodging", is then displayed under the input menu. The fields of menu 7 are configured as touch fields, as are input fields 2. If the user now selects the field, "eating", this field 7a is displayed in color or in an optically highlighted manner. In addition, the selected field is assigned a touch-sensitive input field 8, "open", by which detailed information is displayable. However, the user may change to another field or another input option by touch, or discontinue the method by touching "closing field" 3. After input field 8, "open", is touched, the control unit generates a suggestion list 9, which is illustrated in Fig. 3. To generate this suggestion list 9, the control unit accesses the database of a navigation system, in order to determine the current position of the motor vehicle. Using this current position as a starting point, the control unit searches through an internal and/or external restaurant database. In this context, the control unit selects restaurants located within a certain area around the current position, additional driver preferences, such as "no Japanese food", being considered. If the user would like to

obtain details on a restaurant, this restaurant is selected in suggestion list 9, and inserted field 10, "detail", is activated. An example detailed display is illustrated in Fig. 4. If desired, the user may have the menu read out by activating input field 11, "read out". The activation of input field 4 automatically establishes a telephone connection to the restaurant, in order, for example, to reserve a table. But if the user would like to receive data for navigating to the restaurant, then, by activating input field 12, "navigation", a digital map 13 having route guidance is displayed on display unit 5 as illustrated in Fig. 5, and/or the guidance system is activated.

Illustrated in Fig. 6 is a display of an automatically displayed warning message 14 for a critical condition of the vehicle. The example illustrated is the increased temperature of the engine oil. To this end, the control unit or sensory system responsible for the engine-oil temperature transmits a warning message to the control unit controlling display unit 5. As a result, the control unit generates a corresponding warning message 14 and displays it on display unit 5 in an optically highlighted manner. In order to perceive it in an improved manner, the warning message may be emphasized in color and/or using additional pictographs. Furthermore, additional acoustic and/or haptic warning instructions are also possible. At the same time, the control unit activates the method for active assistance, so that input menu 6 is automatically displayed with assigned input fields 2. Possibilities for action, such as how one may react to the represented, critical vehicle condition, are offered to the driver on these input fields 2. In this case, the motor vehicle driver may select among the options "shut off engine", "call garage", or "ignore". If the motor vehicle driver selects input field 2, "shut off engine", then the control unit automatically switches off the engine. In so doing, the event may be delayed in time, in order that the motor vehicle driver is able to shut off the motor vehicle at a suitable



## ABSTRACT

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[11150/45]

METHOD AND DEVICE FOR ACTIVELY ASSISTING A  
MOTOR VEHICLE DRIVER IN A MOTOR VEHICLE**FIELD OF THE INVENTION**

The present invention relates to a method and a device for implementing the method of actively assisting a motor vehicle driver in a motor vehicle.

5

**BACKGROUND INFORMATION**

Motor vehicles represent an overall system, which is becoming increasingly complex and, on one hand, offers a motor vehicle driver more and more comfort options and, on the other hand, is provided with an increasing number of safety-related systems. However, these safety-related systems must be monitored with regard to their functionality. In the case of a defect or a condition that is critical for the vehicle, a motor vehicle driver often does not know how he or she should react to such an error message indicated, for example, by a lit-up LED. In addition, it is difficult for most motor vehicle drivers to remember how to correctly operate all of the comfort systems, such as navigation, engine-independent heating systems, air conditioning, seat adjusters, mirror adjusting systems, telephone, audio, etc. This results in a multitude of comfort options, which would otherwise be used, not being used at all. In addition, the existing displays only show the motor vehicle driver the actual states, such as "the tank is empty", "inspection interval elapsed", or "for safety reasons, television only during standstill".

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Therefore, it is an object of the present invention [is based on the engineering problem of providing] to provide a method and a device for actively assisting a motor vehicle driver in a motor vehicle, which prevent the problems described above.



[The solution to the engineering problem is given by the subject matters having the features of Claims 1 and 6. Additional advantageous embodiments of the present invention are derived from the dependent claims.]

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**SUMMARY**

To this end, the control unit and an input and display unit automatically assist in the communication between the motor vehicle driver and the vehicle. In order to assist the motor vehicle driver, he or she is offered context- and/or  
10 preference-sensitive input options, which are automatically implemented after being selected by the motor vehicle driver.

In [a preferred] an example embodiment of the present  
15 invention, a control unit monitors the conditions of the vehicle and displays these on a display unit, together with possible actions. The action selected by the motor vehicle driver is then automatically executed by the device. If the control unit detects, for example, that the engine temperature  
20 has exceeded its permissible value, then this is automatically represented on the display unit. In addition, the possible actions such as "shut off engine", "call nearest garage", or "ignore" are represented on the display unit. If the motor vehicle driver selects the action "shut off engine", then the  
25 device automatically switches off the engine. If, however, the motor vehicle driver selects the action "call nearest garage", then the device uses the data of a navigation device to search for the next service station, and uses a car-phone system to automatically dial the number of the service  
30 station. Therefore, the method is not only used to display the critical conditions to the motor vehicle driver, but also to display the appropriate countermeasures, which are then actively supported, as well. To this end, the individual countermeasures [are preferably] may be stored in a situation-  
35 specific manner in a memory assigned to the control unit.

Examples of other critical vehicle conditions include the engine-oil level.

The motor vehicle driver may also be actively assisted in the adjustment of comfort components. For this purpose, the control unit is connected to the corresponding comfort devices. After the motor vehicle driver has manually activated the method, the possible comfort systems are initially represented on the display unit, from which the motor vehicle driver [can] may then select the desired comfort components. In addition, it should be noted that, in this case, manual activation is to be understood as the opposite of automatic activation and therefore includes activation by voice command, as well. After the motor vehicle driver has selected the desired comfort components, the display unit displays which changes [can] may be made and how they [can] may be [carried out] performed. In this context, the display occurs in a context-sensitive manner, i.e., only information relevant for the adjustments is displayed.

If the display unit is [designed] configured as a touch screen, then the corresponding control elements [can] may be ordered in a context-sensitive manner and displayed on the display unit.

The motor vehicle driver [can] may receive further, active assistance from recommendations such as eating, resting, refueling, parking, or spending the night. To this end, the motor vehicle driver manually activates the method again and selects from a suggestion list the recommendations he would like to receive. Access to the data of a navigation system allows a list of possible suggestions to be compiled, driver preferences possibly being considered. In the individual recommendations, the motor vehicle driver [can] may have details displayed for him and, after selecting a recommendation, he [can] may be navigated to what is

recommended or make an order, in which case the number may be automatically dialed.

[Of course, the] The individual methods [can] may also be combined, i.e., one [can] may simultaneously intervene in comfort components and vehicle-condition components. If, for example, the motor vehicle driver selects a television mounted in the vehicle, while driving, then the driver is informed, on one hand, that this is not permissible while driving. In addition, the warning is immediately followed by an inquiry as to whether a possibility for parking [should] may be sought after. If the motor vehicle driver answers this in the affirmative, then the system searches for the next parking possibility with the aid of a navigation system, and navigates the motor vehicle driver to it. Preparatory adjustments, such as the selection of a station, [can] may already be checked and [carried out] performed parallelly to navigating. If the motor vehicle was navigated to the parking spot, the motor vehicle driver is asked if the engine [should] may be shut off, which may then be automatically executed by the system.

The present invention is explained below in detail, using [a preferred exemplary] an example embodiment. [The figures show:]

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic view of a display on a display unit, after the method has been activated[;].

Fig. 2 is a schematic view of a display on the display unit, after the driver has input a request for recommendations[;].

Fig. 3 is a schematic view of a display of a hit list[;].

Fig. 4 is a schematic view of a detailed display of a hit[;].

Fig. 5 is a schematic view of a display of the hits on a digital map[; and].

Fig. 6 is a schematic view of a display of an automatically displayed, critical vehicle condition.

#### DETAILED DESCRIPTION

The method for actively assisting a motor vehicle driver in a motor vehicle is assigned an activation field 1, which [is always situated] may be arranged at the same position on display unit 5, which takes the form of a touch screen. If this activation field 1 is activated, then a control unit [not shown] changes the current display on display unit 5 and generates a first input menu 6 on display unit 5. This input menu 6 includes a marking indicating that the method is activated, in which the name of the function, for example "BUTLER", is made visible, the upper edge of input menu 6 also being rounded off. Furthermore, input menu 6 includes three input fields 2, on which the selection options are alphanumerically displayed. In this context, the user may select among the input options "recommendations", "help", and "repeat status message", input fields 2 being [designed] configured as touch fields. Alternatively, or in addition, the input may be accomplished by voice command and/or using a bidirectional, rotary pressure transducer, which, for example, is described in [EP] European Published Patent Application No. 0 366 132 [B1]. If input option 2a, "recommendations", is [now] selected, the control unit generates a display [according to] illustrated in Fig. 2.

In this case, input menu 6 [from] illustrated in Fig. 1 has been moved up on display unit 5. A menu 7 of the areas, for which the method [can] may give the user recommendations, in this case "eating", "resting", "refueling", "parking", and "lodging", is then displayed under the input menu. The fields

of menu 7 are [designed] configured as touch fields, as are  
input fields 2. If the user now selects the field, "eating",  
this field 7a is [then] displayed in color or in an optically  
highlighted manner. In addition, the selected field is  
5 assigned a touch-sensitive input field 8, "open", by [means  
of] which detailed information is displayable. However, the  
user [can] may change to another field or another input option  
by touch, or discontinue the method by touching "closing  
field" 3. After input field 8, "open", is touched, the  
10 control unit generates a suggestion list 9, which is  
[displayed] illustrated in Fig. 3. To generate this  
suggestion list 9, the control unit accesses the database of a  
navigation system, in order to determine the current position  
of the motor vehicle. Using this current position as a  
15 starting point, the control unit searches through an internal  
and/or external restaurant database. In this context, the  
control unit selects restaurants located within a certain area  
around the current position, additional driver preferences,  
such as "no Japanese food", being considered. If the user  
20 would [now] like to obtain details on a restaurant, this  
restaurant is selected in suggestion list 9, and inserted  
field 10, "detail", is activated. An [exemplary] example  
detailed display is [represented] illustrated in Fig. 4. If  
desired, the user [can] may have the menu read out by  
25 activating input field 11, "read out". The activation of  
input field 4 automatically establishes a telephone connection  
to the restaurant, in order, for example, to reserve a table.  
But if the user would like to receive data for navigating to  
the restaurant, then, by activating input field 12,  
30 "navigation", a digital map 13 having route guidance is  
displayed on display unit 5 as illustrated in [accordance  
with] Fig. 5, and/or the guidance system is activated.

[Represented] Illustrated in Fig. 6 is a display of an  
35 automatically displayed warning message 14 for a critical  
condition of the vehicle. The example [represented here]

illustrated is the increased temperature of the engine oil.

To this end, the control unit or sensory system responsible for the engine-oil temperature transmits a warning message to the control unit controlling display unit 5. As a result, the control unit generates a corresponding warning message 14 and displays it on display unit 5 in an optically highlighted manner. In order to perceive it in an improved manner, the warning message may be emphasized in color and/or using additional pictographs. Furthermore, additional acoustic and/or haptic warning instructions are also possible. At the same time, the control unit activates the method for active assistance, so that input menu 6 is automatically displayed with assigned input fields 2. Possibilities for action, such as how one [could] may react to the represented, critical vehicle condition, are offered to the driver on these input fields 2. In this case, the motor vehicle driver [can] may select among the options "shut off engine", "call garage", or "ignore". If the motor vehicle driver selects input field 2, "shut off engine", then the control unit automatically switches off the engine. In so doing, the event may be delayed in time, in order that the motor vehicle driver is able to shut off the motor vehicle at a suitable location. However, if the motor vehicle driver selects input field 2, "call garage", then the control unit automatically calls the nearest garage. When input field 2, "ignore", is selected, warning message 14 is erased accordingly.

In a method and device for actively assisting a vehicle driver in a motor vehicle by at least one control device and a data entry and display unit, the control device may access data of vehicle state-relevant sensors and of control devices and/or comfort control devices and/or internal or external databases.

10/070074

JC19 Rec'd PCT/PTO 01 MAR 2002

[11150/45]

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Inventor(s) : Gilbert HEISE et al.  
Serial No. : To Be Assigned  
Filed : Herewith  
For : METHOD AND DEVICE FOR ACTIVELY ASSISTING A  
MOTOR VEHICLE DRIVER IN A MOTOR VEHICLE  
Examiner : To Be Assigned  
Art Unit : To Be Assigned

Assistant Commissioner for Patents  
Washington, D.C. 20231

**LETTER TO OFFICIAL DRAFTSPERSON**

S I R:

Kindly approve the proposed changes to the drawings as shown in red ink on the enclosed copies of Figures 1 to 6. The changes consist of changing German-language text to English-language text. No new matter has been added.

Respectfully submitted,

KENYON & KENYON

Dated: 3/1/02

By:

By: *[Signature]*  
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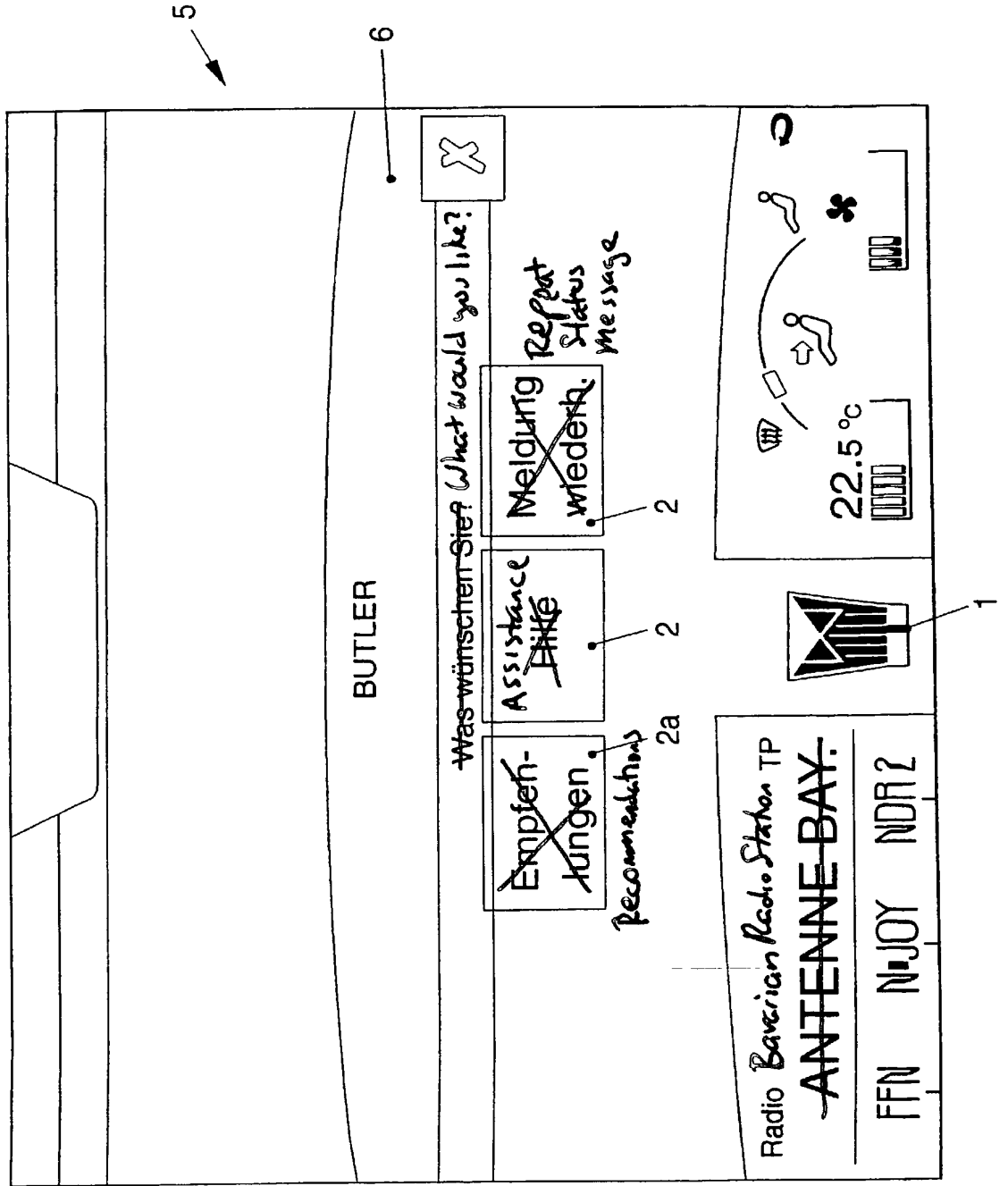


FIG. 1

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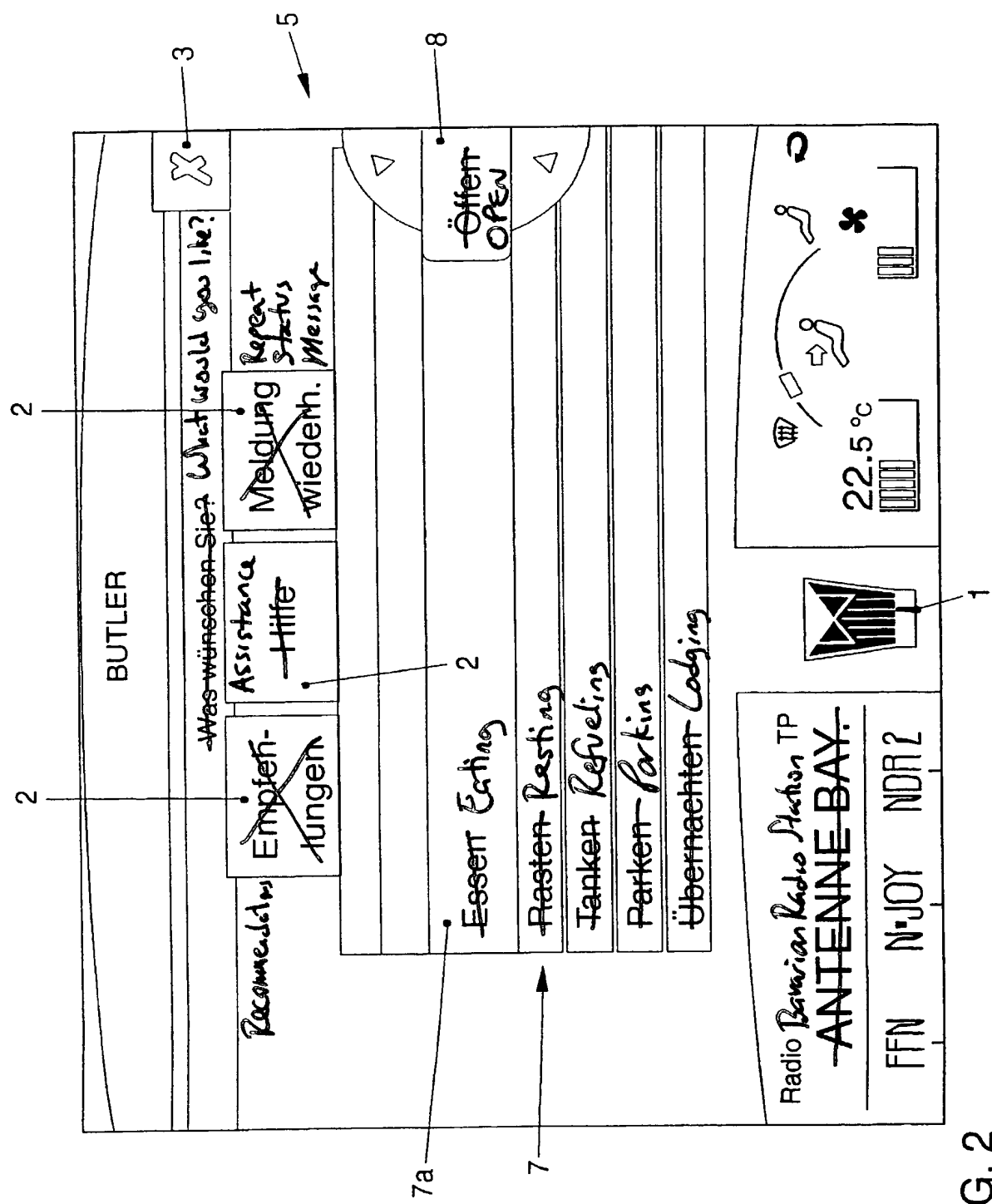


FIG. 2

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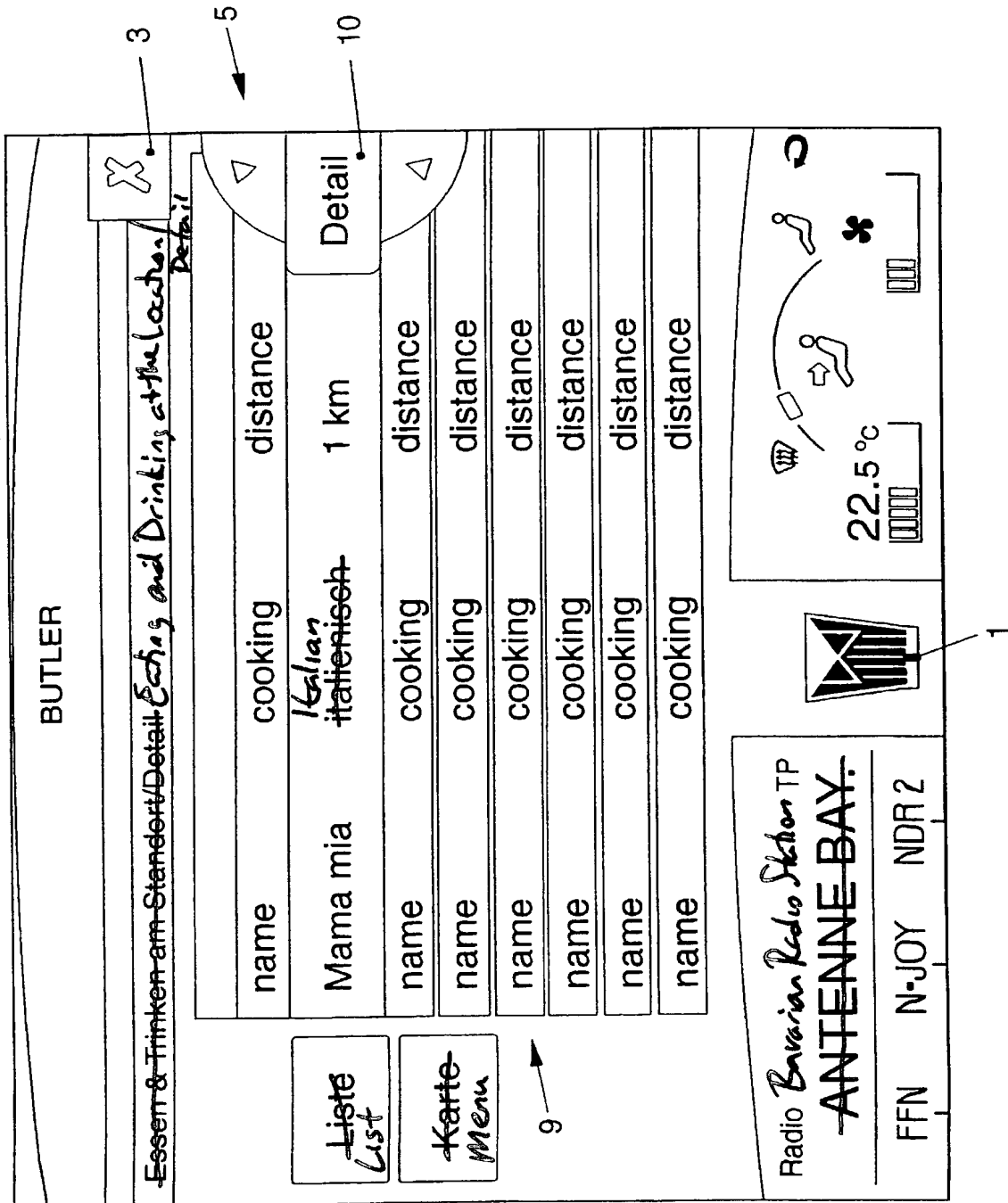


FIG. 3

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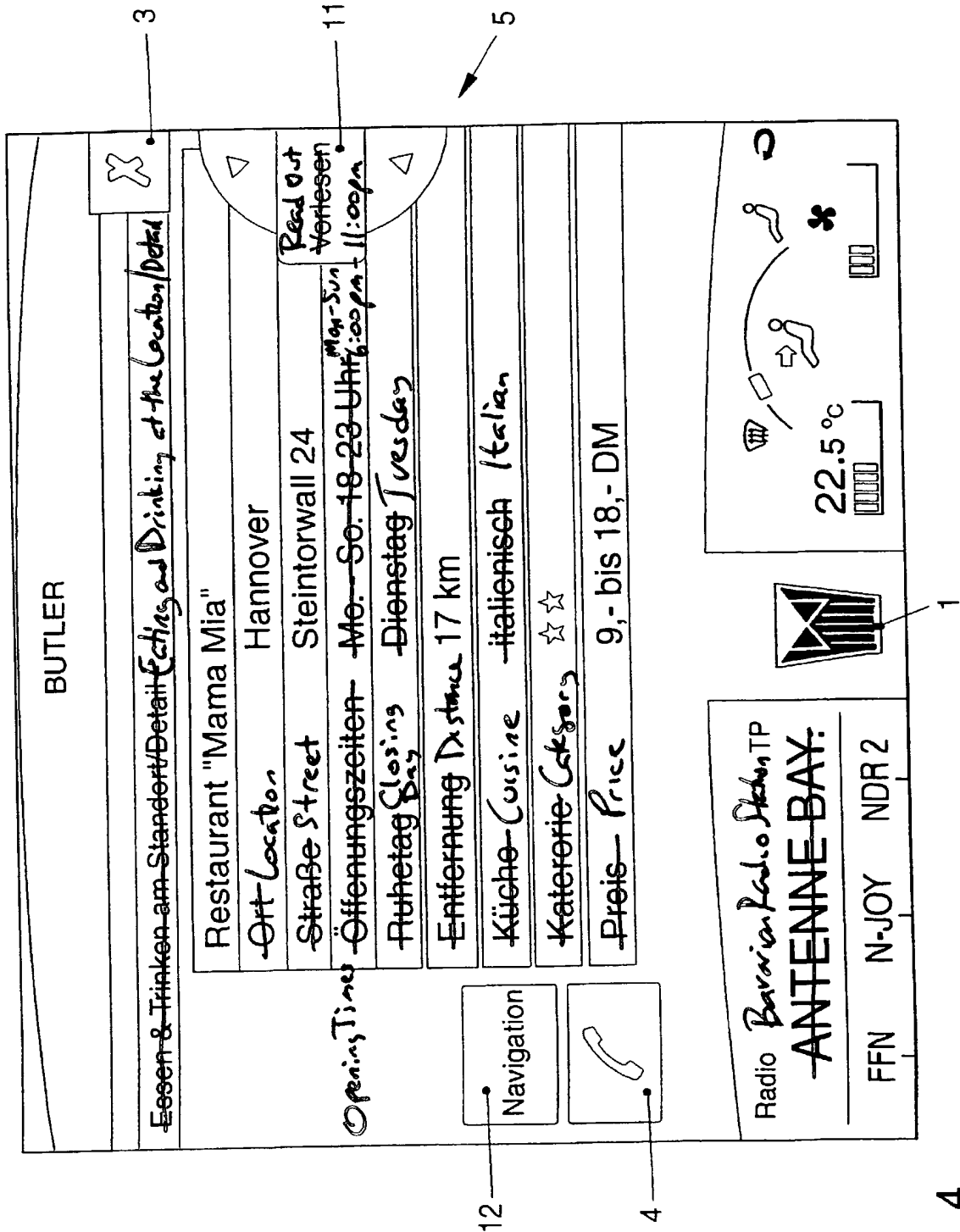


FIG. 4

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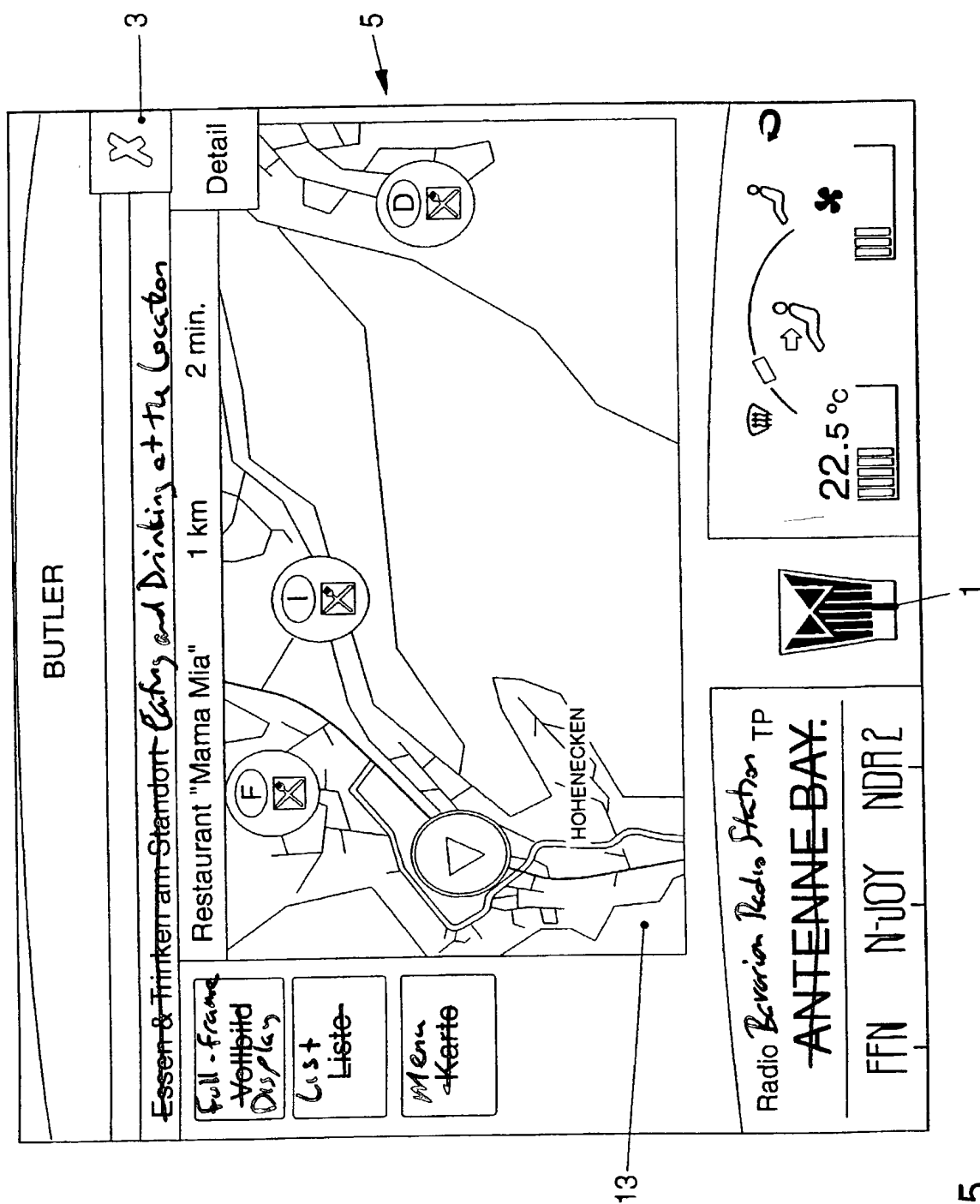


FIG. 5

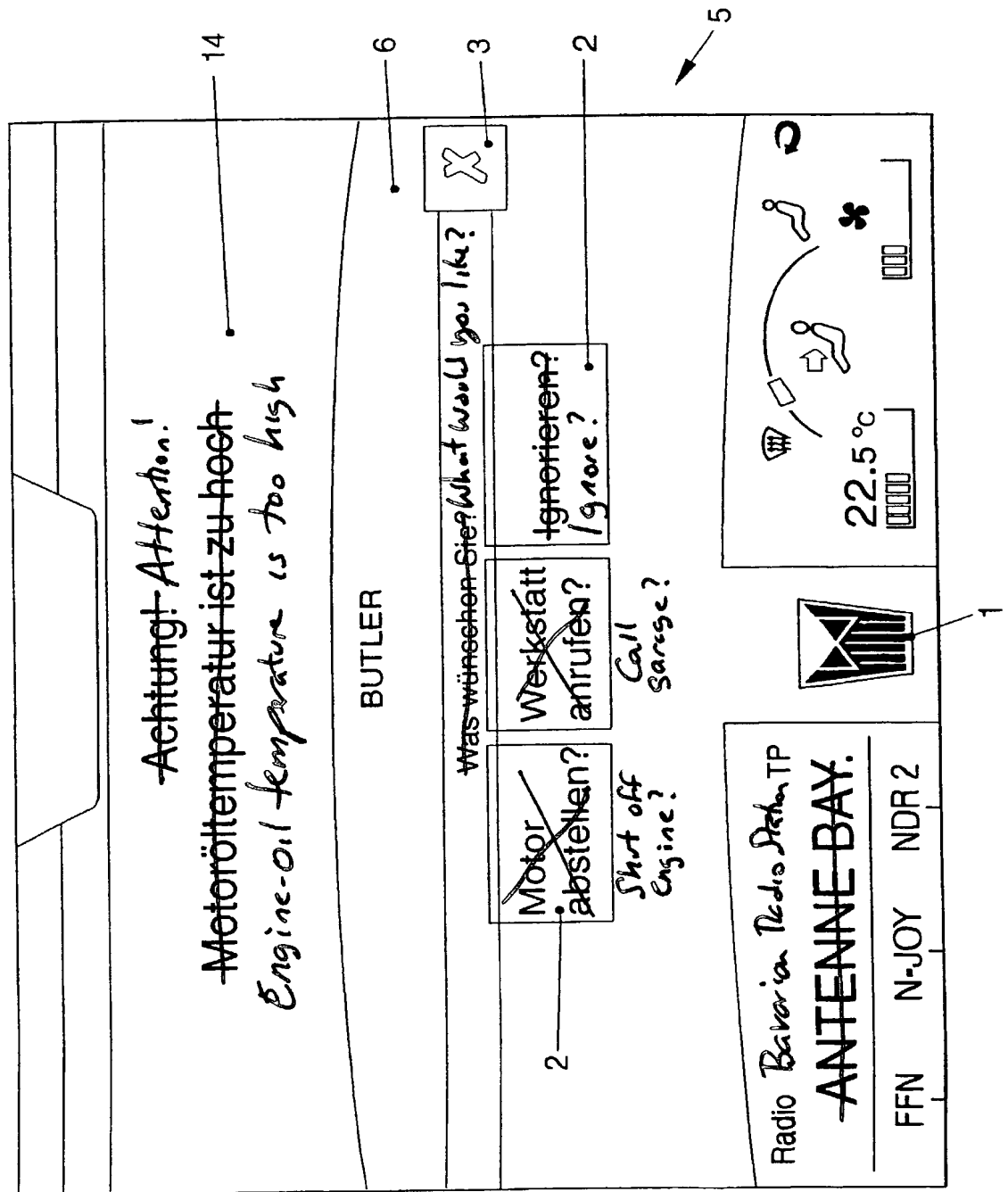


FIG. 6

[11150/45]

METHOD AND DEVICE FOR ACTIVELY ASSISTING A  
MOTOR VEHICLE DRIVER IN A MOTOR VEHICLE

The present invention relates to a method and a device for implementing the method of actively assisting a motor vehicle driver in a motor vehicle.

- 5 Motor vehicles represent an overall system, which is becoming increasingly complex and, on one hand, offers a motor vehicle driver more and more comfort options and, on the other hand, is provided with an increasing number of safety-related systems. However, these safety-related systems must be
- 10 monitored with regard to their functionality. In the case of a defect or a condition that is critical for the vehicle, a motor vehicle driver often does not know how he or she should react to such an error message indicated, for example, by a lit-up LED. In addition, it is difficult for most motor
- 15 vehicle drivers to remember how to correctly operate all of the comfort systems, such as navigation, engine-independent heating systems, air conditioning, seat adjusters, mirror adjusting systems, telephone, audio, etc. This results in a multitude of comfort options, which would otherwise be used,
- 20 not being used at all. In addition, the existing displays only show the motor vehicle driver the actual states, such as "the tank is empty", "inspection interval elapsed", or "for safety reasons, television only during standstill".
- 25 Therefore the present invention is based on the engineering problem of providing a method and a device for actively assisting a motor vehicle driver in a motor vehicle, which prevent the problems described above.
- 30 The solution to the engineering problem is given by the subject matters having the features of Claims 1 and 6.

Additional advantageous embodiments of the present invention are derived from the dependent claims.

To this end, the control unit and an input and display unit automatically assist in the communication between the motor vehicle driver and the vehicle. In order to assist the motor vehicle driver, he or she is offered context- and/or preference-sensitive input options, which are automatically implemented after being selected by the motor vehicle driver.

In a preferred embodiment, a control unit monitors the conditions of the vehicle and displays these on a display unit, together with possible actions. The action selected by the motor vehicle driver is then automatically executed by the device. If the control unit detects, for example, that the engine temperature has exceeded its permissible value, then this is automatically represented on the display unit. In addition, the possible actions such as "shut off engine", "call nearest garage", or "ignore" are represented on the display unit. If the motor vehicle driver selects the action "shut off engine", then the device automatically switches off the engine. If, however, the motor vehicle driver selects the action "call nearest garage", then the device uses the data of a navigation device to search for the next service station, and uses a car-phone system to automatically dial the number of the service station. Therefore, the method is not only used to display the critical conditions to the motor vehicle driver, but also to display the appropriate countermeasures, which are then actively supported, as well. To this end, the individual countermeasures are preferably stored in a situation-specific manner in a memory assigned to the control unit. Examples of other critical vehicle conditions include the engine-oil level.

The motor vehicle driver may also be actively assisted in the adjustment of comfort components. For this purpose, the control unit is connected to the corresponding comfort



devices. After the motor vehicle driver has manually activated the method, the possible comfort systems are initially represented on the display unit, from which the motor vehicle driver can then select the desired comfort components. In addition, it should be noted that, in this case, manual activation is to be understood as the opposite of automatic activation and therefore includes activation by voice command, as well. After the motor vehicle driver has selected the desired comfort components, the display unit displays which changes can be made and how they can be carried out. In this context, the display occurs in a context-sensitive manner, i.e. only information relevant for the adjustments is displayed.

If the display unit is designed as a touch screen, then the corresponding control elements can be ordered in a context-sensitive manner and displayed on the display unit.

The motor vehicle driver can receive further, active assistance from recommendations such as eating, resting, refueling, parking, or spending the night. To this end, the motor vehicle driver manually activates the method again and selects from a suggestion list the recommendations he would like to receive. Access to the data of a navigation system allows a list of possible suggestions to be compiled, driver preferences possibly being considered. In the individual recommendations, the motor vehicle driver can have details displayed for him and, after selecting a recommendation, he can be navigated to what is recommended or make an order, in which case the number may be automatically dialed.

Of course, the individual methods can also be combined, i.e. one can simultaneously intervene in comfort components and vehicle-condition components. If, for example, the motor vehicle driver selects a television mounted in the vehicle, while driving, then the driver is informed, on one hand, that this is not permissible while driving. In addition, the

5 of a navigation system, and navigates the motor vehicle driver to it. Preparatory adjustments, such as the selection of a station, can already be checked and carried out parallelly to navigating. If the motor vehicle was navigated to the parking spot, the motor vehicle driver is asked if the engine should  
10 be shut off, which may then be automatically executed by the system.

- Fig. 1 a display on a display unit, after the method has been activated;
- Fig. 2 a display on the display unit, after the driver has input a request for recommendations;
- 20 Fig. 3 a display of a hit list;
- Fig. 4 a detailed display of a hit;
- Fig. 5 a display of the hits on a digital map; and
- Fig. 6 a display of an automatically displayed, critical vehicle condition.

30 is activated, then a control unit not shown changes the  
current display on display unit 5 and generates a first input  
menu 6 on display unit 5. This input menu 6 includes a  
marking indicating that the method is activated, in which the  
name of the function, for example "BUTLER", is made visible,  
35 the upper edge of input menu 6 also being rounded off.  
Furthermore, input menu 6 includes three input fields 2, on  
which the selection options are alphanumerically displayed.

In this context, the user may select among the input options "recommendations", "help", and "repeat status message", input fields 2 being designed as touch fields. Alternatively, or in addition, the input may be accomplished by voice command and/or using a bidirectional, rotary pressure transducer, which, for example, is described in EP 366 132 B1. If input option 2a, "recommendations", is now selected, the control unit generates a display according to Fig. 2.

In this case, input menu 6 from Fig. 1 has been moved up on display unit 5. A menu 7 of the areas, for which the method can give the user recommendations, in this case "eating", "resting", "refueling", "parking", and "lodging", is then displayed under the input menu. The fields of menu 7 are designed as touch fields, as are input fields 2. If the user now selects the field, "eating", this field 7a is then displayed in color or in an optically highlighted manner. In addition, the selected field is assigned a touch-sensitive input field 8, "open", by means of which detailed information is displayable. However, the user can change to another field or another input option by touch, or discontinue the method by touching "closing field" 3. After input field 8, "open", is touched, the control unit generates a suggestion list 9, which is displayed in Fig. 3. To generate this suggestion list 9, the control unit accesses the database of a navigation system, in order to determine the current position of the motor vehicle. Using this current position as a starting point, the control unit searches through an internal and/or external restaurant database. In this context, the control unit selects restaurants located within a certain area around the current position, additional driver preferences, such as "no Japanese food", being considered. If the user would now like to obtain details on a restaurant, this restaurant is selected in suggestion list 9, and inserted field 10, "detail", is activated. An exemplary detailed display is represented in Fig. 4. If desired, the user can have the menu read out by activating input field 11, "read out". The activation of

input field 4 automatically establishes a telephone connection to the restaurant, in order, for example, to reserve a table. But if the user would like to receive data for navigating to the restaurant, then, by activating input field 12,

5 "navigation", a digital map 13 having route guidance is displayed on display unit 5 in accordance with Fig. 5, and/or the guidance system is activated.

Represented in Fig. 6 is a display of an automatically  
10 displayed warning message 14 for a critical condition of the vehicle. The example represented here is the increased temperature of the engine oil. To this end, the control unit or sensory system responsible for the engine-oil temperature transmits a warning message to the control unit controlling  
15 display unit 5. As a result, the control unit generates a corresponding warning message 14 and displays it on display unit 5 in an optically highlighted manner. In order to perceive it in an improved manner, the warning message may be emphasized in color and/or using additional pictographs.  
20 Furthermore, additional acoustic and/or haptic warning instructions are also possible. At the same time, the control unit activates the method for active assistance, so that input menu 6 is automatically displayed with assigned input fields 2. Possibilities for action, such as how one could react to  
25 the represented, critical vehicle condition, are offered to the driver on these input fields 2. In this case, the motor vehicle driver can select among the options "shut off engine", "call garage", or "ignore". If the motor vehicle driver selects input field 2, "shut off engine", then the control  
30 unit automatically switches off the engine. In so doing, the event may be delayed in time, in order that the motor vehicle driver is able to shut off the motor vehicle at a suitable location. However, if the motor vehicle driver selects input field 2, "call garage", then the control unit automatically  
35 calls the nearest garage. When input field 2, "ignore", is selected, warning message 14 is erased accordingly.

What is Claimed is:

1. A method for actively assisting a motor vehicle driver in a motor vehicle,  
wherein automatic assistance in the communication between the motor vehicle driver and the vehicle system is given by at least one control unit and an input and display unit (5).
2. The method for active assistance as recited in Claim 1, wherein context-specific and/or preference-specific input options (2, 3, 4, 7, 8, 9, 10, 11, 12) are offered to the motor vehicle driver, which are automatically executed after being selected by the motor vehicle driver.
3. The method for active assistance as recited in Claim 1 or 2, the control unit being able to access the data of sensors and control units relevant to the condition of the vehicle, and transmit control commands to the control units as well as to devices for external communication; comprising the following method steps:
  - a) detection of a critical vehicle condition by the control unit, by evaluating the data of the sensors and control units relevant to the vehicle;
  - b) generation of a list of possible actions for the motor vehicle driver in response to the critical vehicle condition detected;
  - c) display of the detected, critical vehicle condition and the possible actions of the motor vehicle driver, on the display unit; and
  - d) execution of the action selected by the motor vehicle driver, using the control unit.
4. The method for active assistance as recited in Claim 1 or 2, the control unit being able to access the data of comfort control units, and transmit control commands to

the comfort devices; comprising the following method steps:

- a) manual activation of the method by the motor vehicle driver;
  - b) display of an input prompt on the display unit (5), as to which comfort setting should be changed;
  - c) context-sensitive and preference-sensitive compiling of the operational settings and/or control elements relevant to the input, on the display unit, using the control unit; and
  - d) execution of the inputted control commands.
5. The device for active assistance as recited in Claim 1 or 2, the control unit being able to access an internal and/or external database, comprising the following method steps:
- a) manual activation of the method by the motor vehicle driver;
  - b) display of a list (7) of possible recommendations on the display unit;
  - c) execution of a context-sensitive and/or preference-sensitive interrogation dialog to ascertain the driver command;
  - d) display of the possible actions, which may be carried out for the ascertained driver command; and
  - e) execution of the action selected by the motor vehicle driver, using the control unit.
6. A device for actively assisting a motor vehicle driver in a motor vehicle, comprising at least one control unit and an input and display unit (5), conditions critical to the vehicle being detectable and displayable on the display unit (5), along with assisting messages, which may be automatically carried out after being selected; and, using the input unit, further comfort options being

retrievable, which may be selected and executed in a dialog mode.

7. The device as recited in the Claim 6, wherein the input options (2, 3, 4, 7, 8, 9, 10, 11, 12) displayed on the display unit (5) may be represented by the control unit in a context-specific and/or preference-specific manner.
8. The device as recited in Claim 6 or 7, wherein the control unit is connected to other control units of the motor vehicle by a CAN bus.
9. The device as recited in one of Claims 6 through 8, wherein the display unit (5) takes the form of a touch screen.
10. The device as recited in one of Claims 6 through 9, wherein the input unit takes the form of a voice-recognition unit and/or a bidirectional, rotary pressure transducer.

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES  
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum  
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(81) Bestimmungsstaaten (national): CN, IN, JP, KR, US.

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NL, PT, SE).

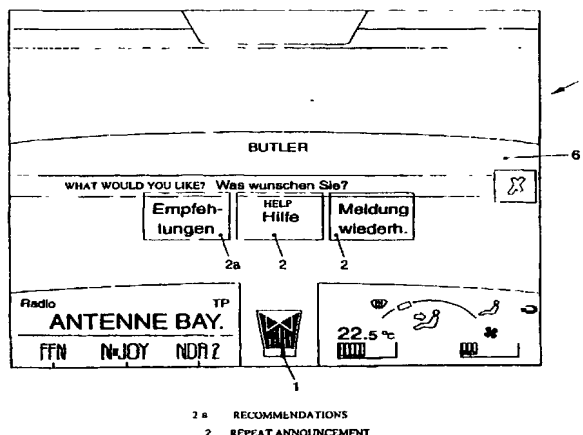
**Veröffentlicht:**

— Mit internationalem Recherchenbericht.

Zur Erklärung der Zweibuchstaben-Codes, und der anderen  
Abkürzungen wird auf die Erklärungen ("Guidance Notes on  
Codes and Abbreviations") am Anfang jeder regulären Ausgabe  
der PCT-Gazette verwiesen.

(54) Title: METHOD AND DEVICE FOR ACTIVELY ASSISTING A VEHICLE DRIVER IN A MOTOR VEHICLE

(54) Bezeichnung: VERFAHREN UND VORRICHTUNG ZUR AKTIVEN HILFESTELLUNG EINES KRAFTFAHRZEUG-  
FÜHRERS IN EINEM KRAFTFAHRZEUG



(57) Abstract: The invention relates to a method and device for actively assisting a vehicle driver in a motor vehicle by means of at least one control device and of a data entry and display unit, whereby the control device can access data of vehicle state-relevant sensors and of control devices and/or comfort control devices and/or internal or external databases.

(57) Zusammenfassung: Die Erfindung betrifft eine Verfahren und eine Vorrichtung zur aktiven Hilfestellung eines Kraftfahrzeugführers in einem Kraftfahrzeug, mittels mindestens eines Steuergerätes und einer Ein- und Anzeigeeinheit, wobei das Steuergerät auf die Daten von fahrzeugzustandsrelevanten Sensoren und Steuergeräte und/oder Komfortsteuergeräte und/oder interne oder externe Datenbanken zugreifen kann.

WO 01/17812 A1



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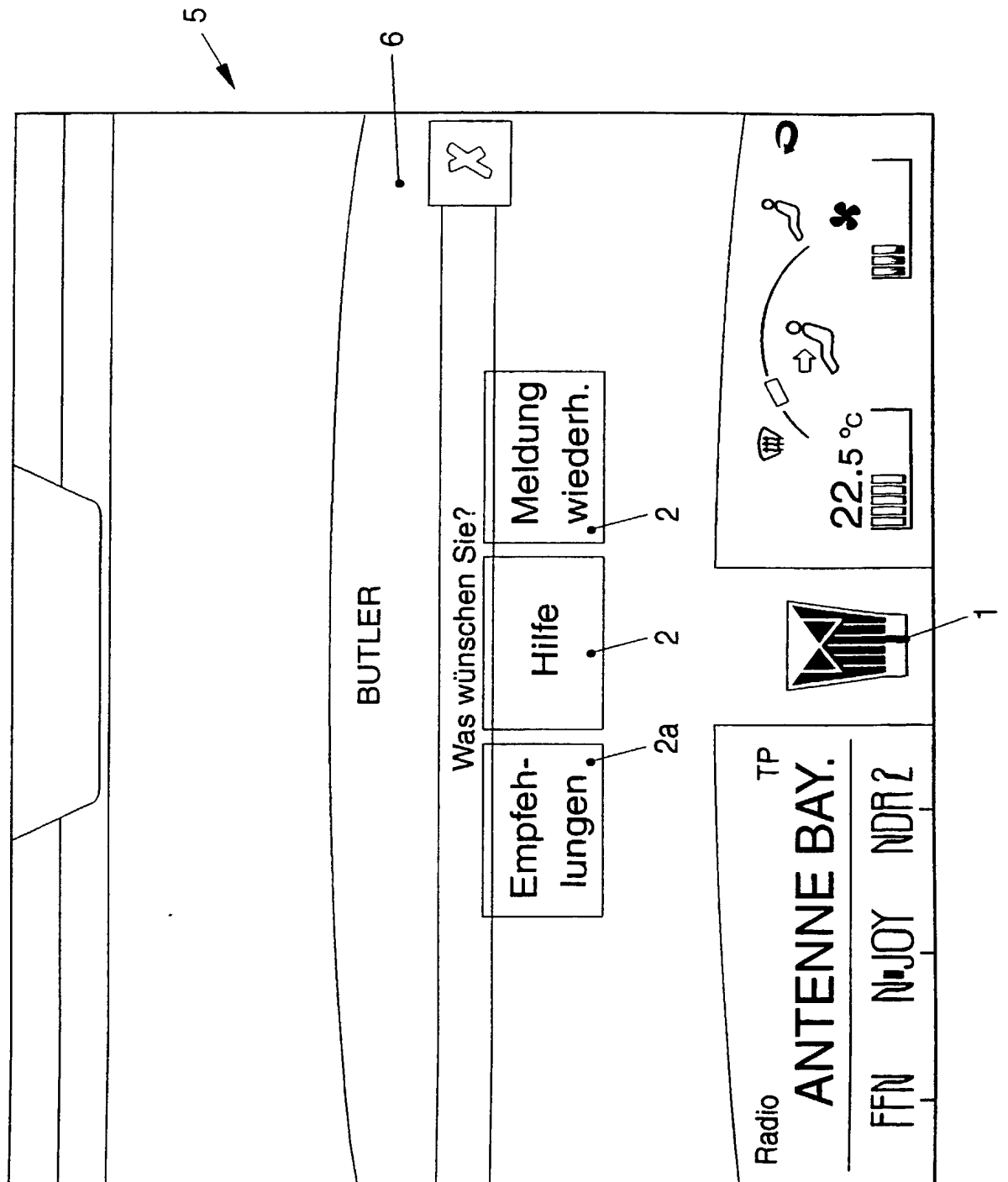


FIG. 1

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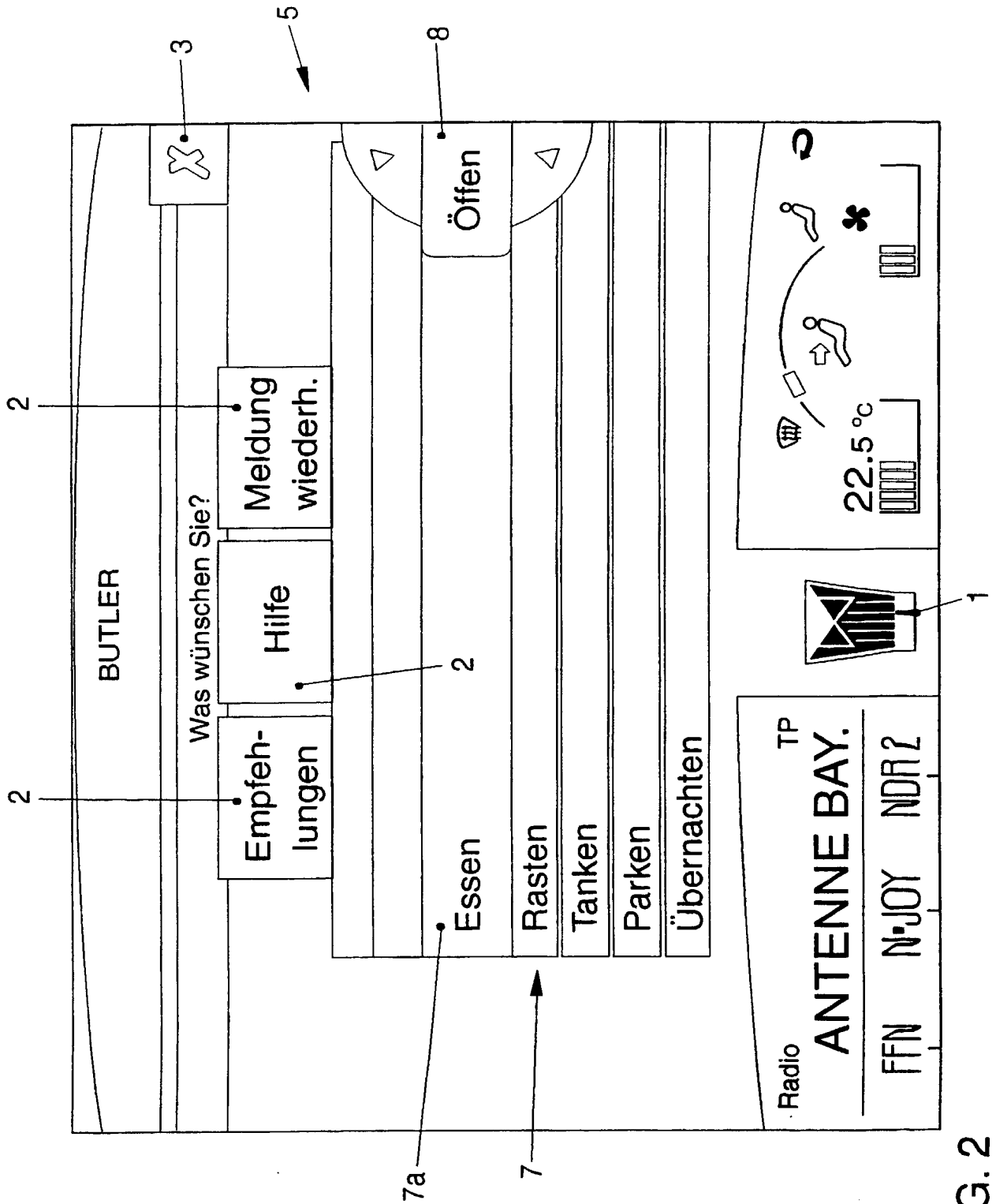
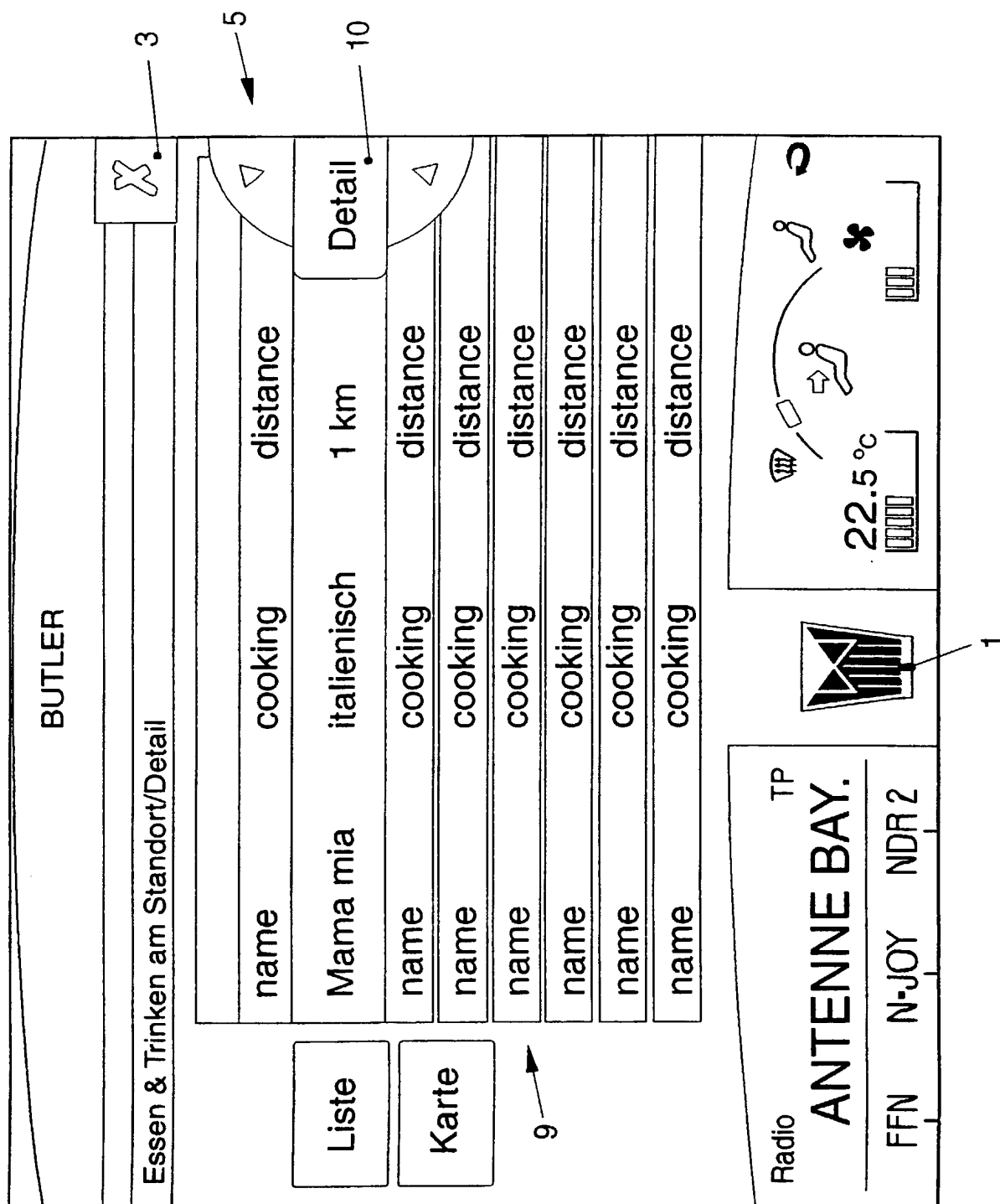


FIG. 2



**FIG. 3**

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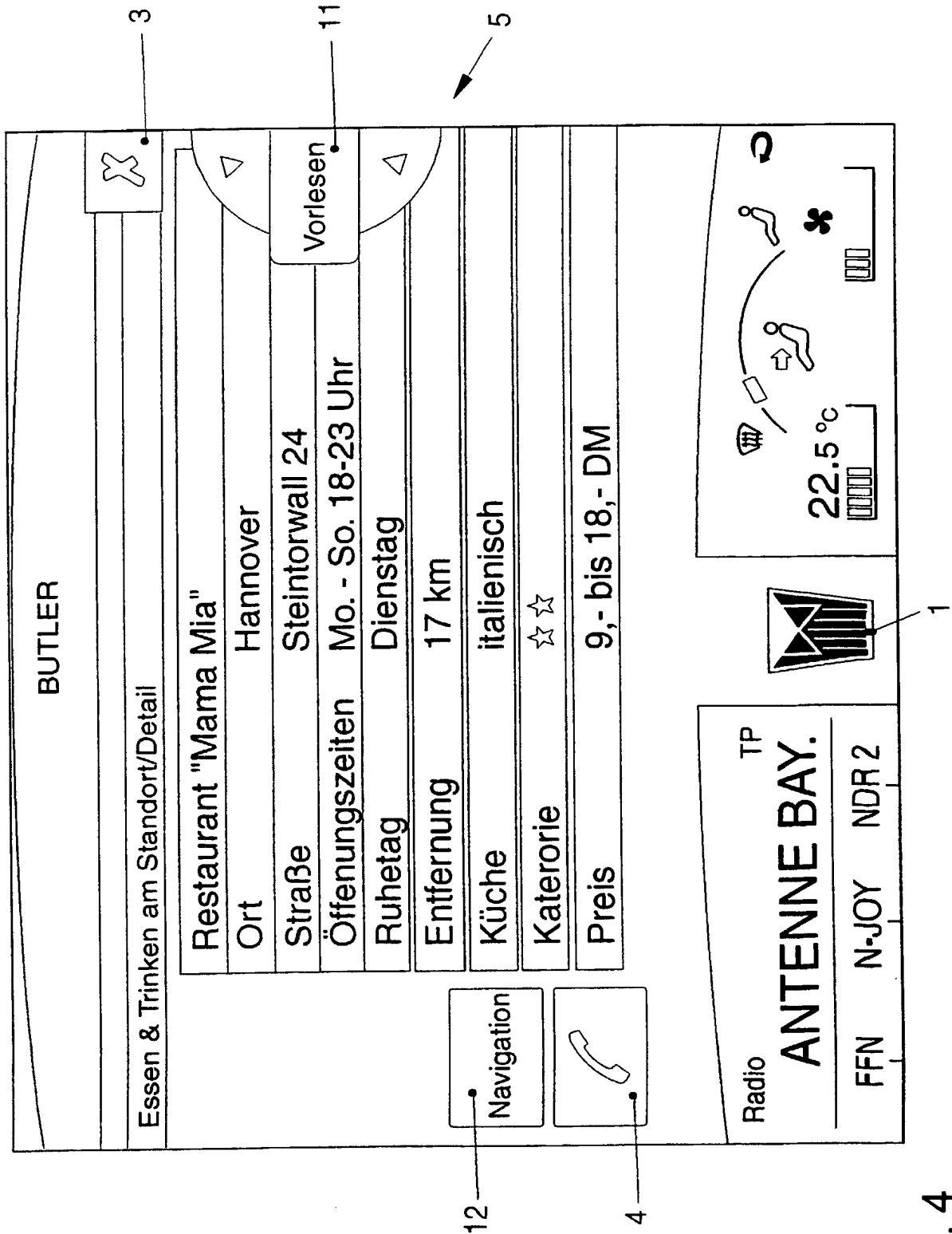


FIG. 4

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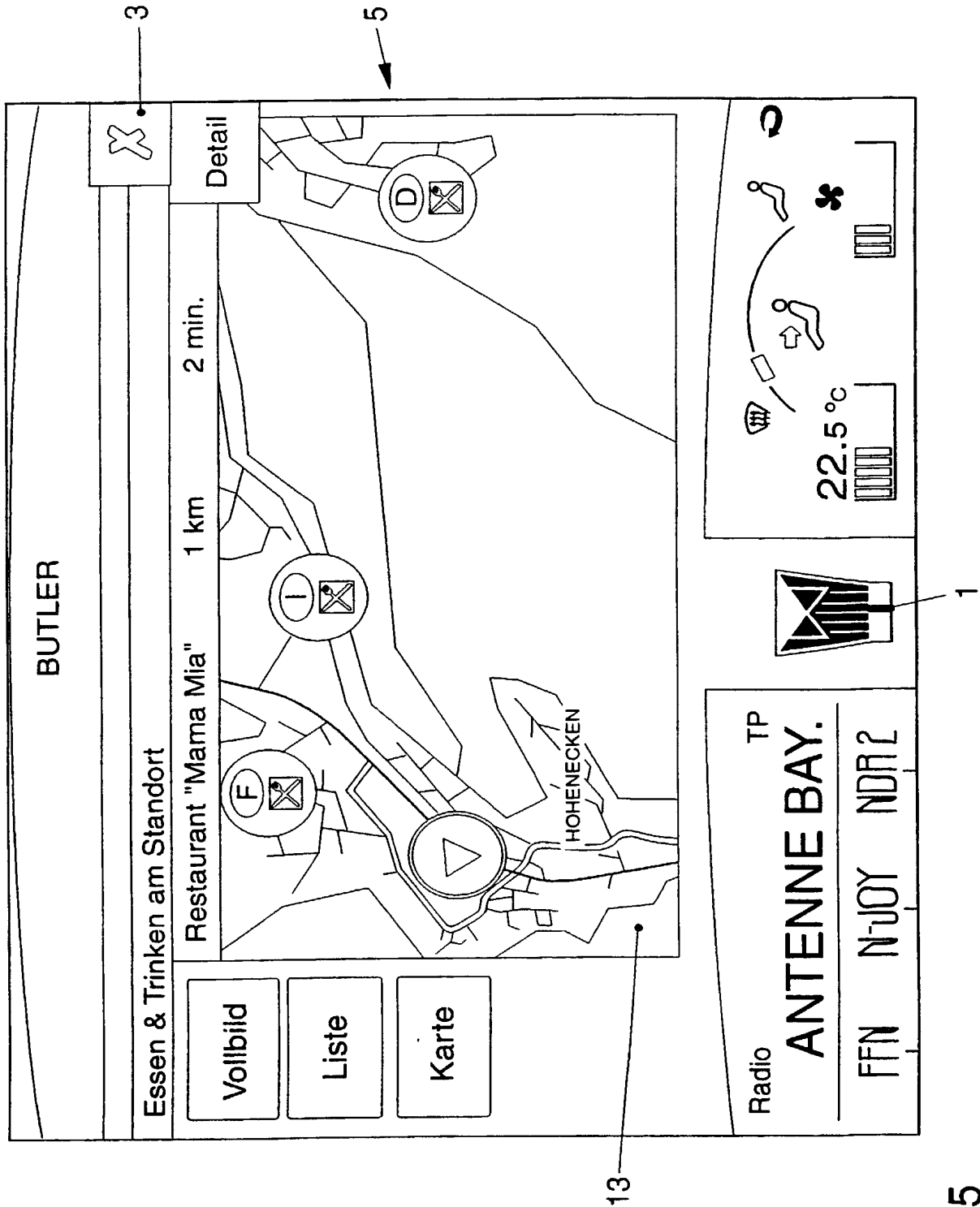


FIG. 5

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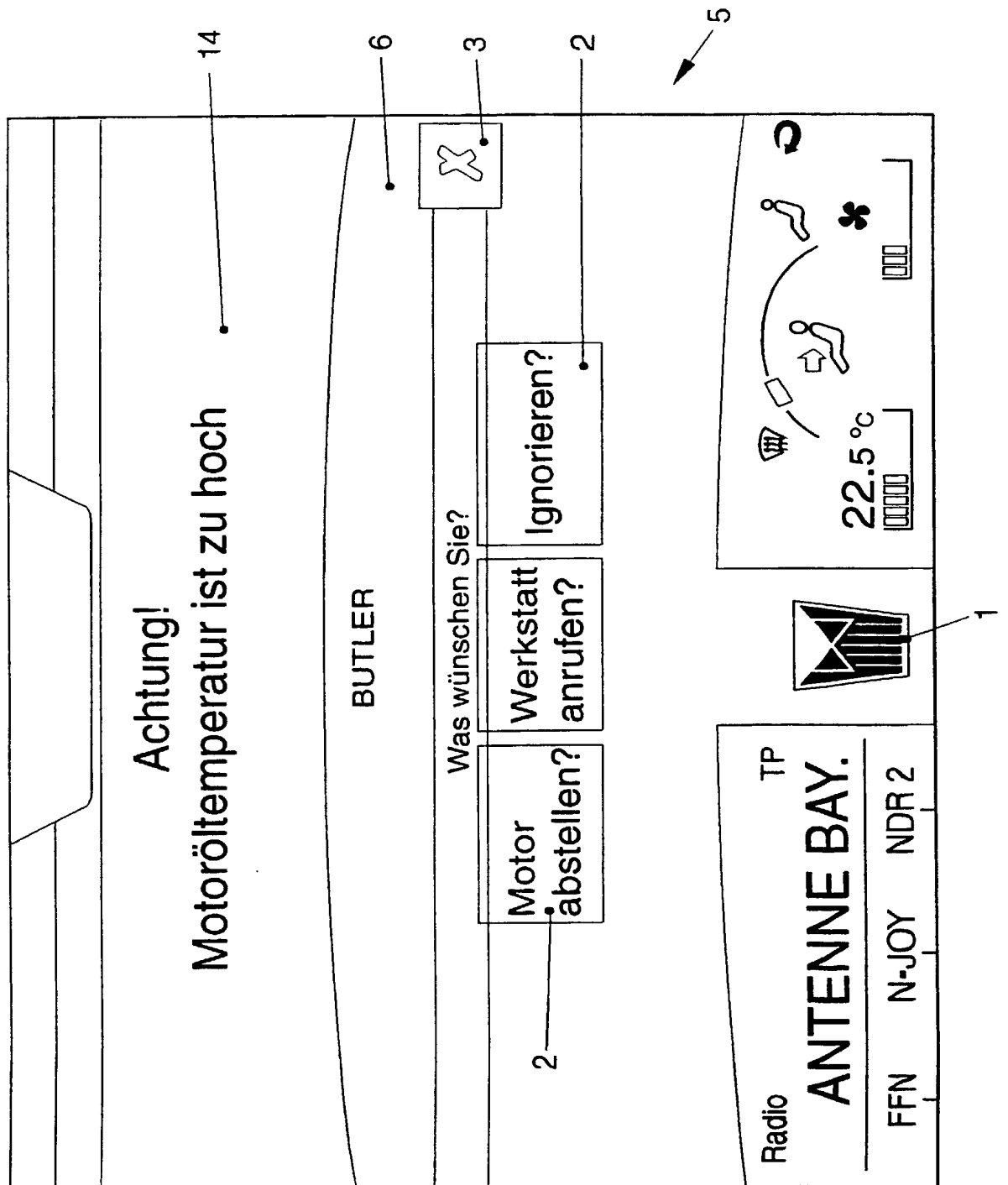


FIG. 6

[11150/45]

**DECLARATION AND POWER OF ATTORNEY**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled **METHOD AND DEVICE FOR ACTIVELY ASSISTING A MOTOR VEHICLE DRIVER IN A MOTOR VEHICLE**, the specification of which was filed as PCT International Application No. PCT/EP00/08250 on August 24, 2000.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application(s) for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

**PRIOR FOREIGN APPLICATION(S)**

Number	Country Filed	Day/Month/Year	Priority Claimed Under 35 USC 119
199 41 973.6	Fed. Rep. of Germany	September 3, 1999	Yes

$$\begin{aligned} \frac{\partial}{\partial t} \left( \frac{1}{2} \rho \mathbf{u} \cdot \mathbf{u} \right) + \frac{\partial}{\partial x} \left( \frac{1}{2} \rho \mathbf{u} \cdot \mathbf{u} \right) &= \frac{\partial}{\partial t} \left( \frac{1}{2} \rho \mathbf{u} \cdot \mathbf{u} \right) + \frac{\partial}{\partial x} \left( \frac{1}{2} \rho \mathbf{u} \cdot \mathbf{u} \right) \\ &= \frac{\partial}{\partial t} \left( \frac{1}{2} \rho \mathbf{u} \cdot \mathbf{u} \right) + \frac{\partial}{\partial x} \left( \frac{1}{2} \rho \mathbf{u} \cdot \mathbf{u} \right) \end{aligned}$$

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NY01 448682 v 1



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Inventor:

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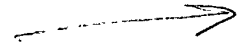
Date: 25-04-02

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Federal Republic of Germany

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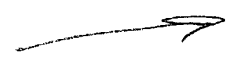
Inventor: Gerald BUSSE

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